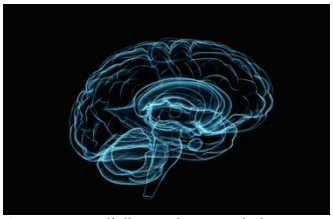
**European Science, Engineering and Technology Highlights[1]**
**APRIL 2014**

*To navigate down the report, hold down the CTRL key and click on the title to go to the desired article. You may return to the selected country by clicking on the ⇮ at the bottom of each article.*



[1] *Note: If you would like additional information or background, please feel free to contact either Carine Polliotti at cpolliot@nsf.gov or Ana Helman at ahelman@nsf.gov*

## 1 US and European Brain Mapping Projects to Join Forces



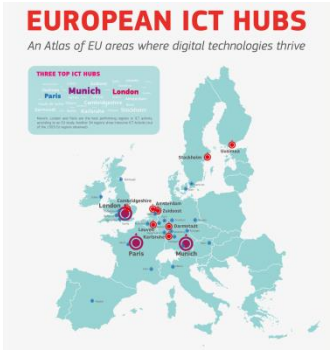
*©Jesper Hilding Klausen/Alamy*

It seems a natural pairing, almost like the hemispheres of a human brain: two controversial and ambitious projects that seek to decipher the body's control center are poised to join forces. The European Union's €1-billion (US$1.3-billion) Human Brain Project (HBP) and the United States' $1-billion Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative will launch a collaboration later this year, according to government officials involved in both projects. Representative Chaka Fattah (Democrat, Pennslyvania) hinted at the plan in a speech on 12 March. The brain, he says, "is something that has defied understanding. You can't imagine a more important scientific cooperation", says Fattah, the highest-ranking Democratic member of a House of Representatives panel that oversees funding for several US science agencies. Details about how closely the US and European programmes will coordinate are still nebulous, but US government officials say that the effort will include all of the BRAIN Initiative's government partners — the US National Institutes of Health (NIH), the National Science Foundation and Defense Advanced Research Projects Agency. Henry Markram, a neuroscientist at the Swiss Federal Institute of Technology in Lausanne (EPFL), who directs the HBP, says that Israel's brain initiative will also be involved.

Some researchers working on BRAIN and HBP have already begun to coordinate their research informally. The Allen Institute for Brain Research in Seattle, Washington — a BRAIN Initiative partner — has published papers on neural simulations it produced in collaboration with the HBP. Miyoung Chun, executive vice-president of science programmes at the Kavli Foundation in Oxnard, California, says that all of the partners in the US brain project — of which the Kavli Foundation is one — are aware of how challenging the collaboration with the HBP will be, even for seemingly mundane tasks such as processing and sharing large amounts of data. "It's not even easy to share data within a lab," Chun says. "Imagine if you want to share it with everybody."

*Full article available at: http://www.nature.com/news/brain-mapping-projects-to-join-forces-1.14871*

## 2 New European Commission Study Identifies Europe's Top Information and Communication Technology Hubs




Wondering what makes an Information and Communication Technologies (ICT) hotspot? Take a look at Munich, London, Paris or smaller cities such as Darmstadt identified in a new EU Atlas of ICT hotspots. This atlas shows where digital technologies thrive and examines the factors contributing to this success. Most of Europe's ICT activity takes place in 34 regions across 12 countries. Key ingredients to success included access to top Universities and research centers and funding opportunities such as venture capital.

The study also underlines the importance of smaller regions. For example, Darmstadt -a city of 150.000 people– building on its research & innovative output and on its active business community, ranks number seven at EU's top 10 ICT Poles of excellence. Other small-sized regions showing strong performance are Leuven, Karlsruhe or Cambridge.

A region's ICT excellence is linked to research and development activities, to the ability to take knowledge to market (innovation) and to building an intense business activity around this innovation. It seems that ICT thriving regions:

- are mostly long standing industrial areas;
- have high-standard educational institutions and other key innovation players;
- have long-term policies on research and innovation;
- have enjoyed historical opportunities (such as being the political national capitals);
- tend to cluster together (half of the 34 Poles of excellence are neighbouring regions).

This effect is also observed in places like the Silicon Valley (USA), Bangalore (India) or Changzhou (China).

The top 10 performing regions according to the EIPE Composite Indicator

1. München, Kreisfreie Stadt, Germany
2. Inner London – East, United Kingdom
3. Paris, France
4. Karlsruhe, Stadtkreis, Germany
5. Cambridgeshire CC, united Kingdom
6. Stockholms lan, Sweden
7. Darmstadt, Kreisfreie Stadt, Germany,
8. Uusimaa, Finland
9. Zuidoost-Noord-Brabant, the Netherlands
10. Groot-Amsterdam, the Netherlands

*More information available at: http://europa.eu/rapid/press-release_IP-14-435_en.htm*

## 3 The European Commission Publishes the 2013 Joint Research Center Annual Report


The Annual Report provides an overview of the Joint Research Center, the European Commission's in-house science service, main activities, accomplishments and resources in 2013, highlighting its scientific and technical support to several EU key priorities: the economic and monetary union; the single market, growth, jobs and innovation; a low-carbon economy and resource efficiency; agriculture and global food security; public health and (nuclear) safety and security. A special chapter is also dedicated to the JRC's work in the field of standardisation, including the most significant examples.

*More information available at:*
*http://ec.europa.eu/dgs/jrc/index.cfm?id=1410&dt_code=NWS&obj_id=19710&ori=RSS*

## 4 Estonian Parliament Approves the 2014-2020 Strategy for Research, Development and Innovation

"Knowledge Based Estonia 2014–2020" is Estonia's third strategy on research and development and innovation, which takes into account the experiences and lessons of the previous period, recommendations of experts, tasks arising from the Constitution and other legislation, as well as future trends, the government press office said. Where the previous strategies focused primarily on developing Estonia's capability in research and development and innovation, the new strategy aims to use the created potential for the good of Estonia's development and economic growth. In the setting of priorities the methodology of smart specialization will serve as basis. The European Union has identified as a goal reaching research and development intensity equaling 3 percent of gross domestic product (GDP) by 2020, one percent of which will be public sector spending. Arising from that also the

competitiveness plan Estonia 2020 aims to achieve research and development intensity of 2 percent of GDP by 2015 and 3 percent by 2020, one percent of which is expenditures by the public sector.

The strategy identifies four key goals:
- Excellence in research;
- Increasing the socio-economic impact of R&D;
- Changing economic structure: smart specialization;
- Estonia is active in international RD&I cooperation.

*Full article available at:*
*http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/ee/highlights/highlight_0014*

## 5 Germany is investing 3% of GDP in R&D - target achieved!


According to figures released by the German Stifterverband and a corresponding press release by the Federal Ministry for Education and Research (BMBF) , the total spending on R&D in Germany reached a new record high. The preliminary estimates assume an increase in business expenditures on R&D of 5.3% compared to 2011, +6% in spending on R&D by Higher Education Institutions, and +4.8% with regard to Public Research Organizations. Overall, R&D expenditures in 2012 are estimated to be totaling €79.5b (USD 109 billion), i.e. the R&D/GDP ratio went up to 2.98%. In this light, the Ministry states that the 3% target has been achieved.

During the period 2010 – 2013, the Federal Government invested over €13b (USD 18 billion) more in the key areas of education and research than the €12b (USD 16.5 billion) previously planned. Between 2005 and 2013, the federal budget for R&D increased by about 60%.

*Full article available at:*
*http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/de/highlights/highlight_0017*

## 6 The New Italian National Research Plan for 2014-2020 Announced

At the end of January 2014 the Italian Minister for Education University and Research (MIUR) Maria Chiara Carrozza introduced to the Council of Ministers of the government the new National Program for Research (PNR) 2014-2020. PNR2014-2020 is the strategy document of MIUR which will complement the previously published "Horizon2020 Italia - HIT2020" document and outlines long term targets of the Research & Innovation system.

The PNR 2012-2020 has been set up on a seven years strategy, in order to be coherent with the EU Horizon program and with EU structural funding framework to facilitate cross border interoperability. The new PNR defines 11 grand challenges for the Research & Innovation system:

- Scientific and cultural progress
- Health, demographic change and wellbeing
- European Bio-economy Challenges
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials

- Europe in a changing world - inclusive, innovative and reflective societies
- Space and astronomy
- Secure societies - protecting freedom and security of Europe and its citizens
- Restoring, preserving, valuing & managing the European Cultural Heritage, Creativity
- Digital Agenda

MIUR committed a total yearly investment of 900 millions (USD 1240 million) Euros to implement the measures included in the program.

*Full article available at:*
*http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/it/highlights/highlight_0005*

## 7 New Mobility Grant Scheme in Norway

The Research Council of Norway is issuing a call for an entirely new mobility grant for young researchers seeking to work abroad. The grant scheme is open to applicants in all fields and disciplines and is designed to promote mobility and enhance career development among young researchers. Applicants must have successfully defended their doctoral thesis less than six years ago to be eligible. Increasing the number of Norwegian researchers conducting research stays at top institutions abroad is an overall Research Council objective. Activities abroad enable researchers to develop their independence, establish their own networks and co-author publications with researchers other than their doctoral supervisors. The scheme involves cooperation with a Norwegian host institution that "lends" a researcher to an institution abroad and receives funding for a year of reintegration upon the researcher's return. This enables both the Norwegian host institution and the researcher him- or herself to put the knowledge and networks gained during the stay abroad to use at home.

Funding is available for 14 mobility grants in 2014, with a total budget of roughly NOK 45 million (USD 7.4 million).

*Full article available at:*
*http://www.forskningsradet.no/en/Newsarticle/New_mobility_grant_under_the_FRIPRO_scheme/1253993802969*

## 8 New Legislation in Sweden to Help Foreign Postgraduates Stay On

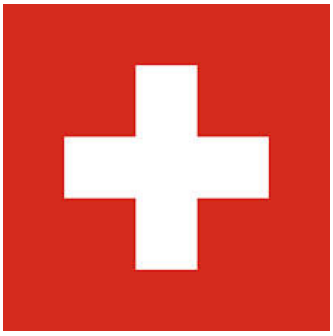
On 1 July this year, new legislation will come into force in Sweden that includes measures which will make it considerably easier for foreign doctoral candidates and students to stay and work in the country after graduating. An agreement between the outgoing Alliance government and the Swedish Green party will secure a majority vote for the proposal in the parliament. Doctoral candidates are included in the legal text together with international migrant workers, and they will be able to qualify for permanent residence permits after their studies, so long as they have spent four out of the past seven years in Sweden with a study permit. Foreign students will also be allowed to stay in Sweden after graduating, to apply for work or investigate the possibility of establishing their own company. The draft legislation does not specify how long they will be able to stay, but it could be for six months after graduation.

*Full article available at: http://www.universityworldnews.com/article.php?story=20140320135515441*

## 9 Swiss Science Set to Stay International

*By Martin Vetterli, Swiss National Science Foundation, Bern, Switzerland*

Curbs on immigration resulting from last month's Swiss referendum (see Nature 506, 265; 2014) have led



to Switzerland's exclusion from the competition for European Research Council (ERC) grants. This is a devastating blow, given that the country has the highest share of international researchers on ERC grants. Thanks to the Swiss National Science Foundation (SNSF) stepping in to run a temporary parallel program, however, Swiss science can remain international and competitive. The SNSF has supported basic science through single-investigator grants for more than 60 years. The new temporary SNSF schemes will help researchers who are working in Switzerland or negotiating with Swiss institutions and who were planning to participate in the ERC competition. The schemes will have similar deadlines, procedures and success rates to the ERC's, and the evaluation panels will comprise distinguished scientists from Switzerland and abroad. ERC grants represent a sort of 'Champions League' for researchers in Europe, and so it will not be easy to run a local program of the same caliber. However, Switzerland will now be able to maintain its strong international track record: 49% of our professorial bodies are international, 33% of our researchers are abroad, and 28% of our students are foreigners.

*Full article available at: http://www.nature.com/nature/journal/v507/n7493/full/507431a.html*

## 10 The UK Publishes the Research Performance and Economic Impact Report

In 2012/13, the Engineering and Physical Sciences Research Council (EPSRC) continued to invest in world-leading research and training to fuel long-term growth through active sponsorship of its £3.3 billion* (USD 5.4 billion) portfolio of research and training, including areas of research aligned to the UK Government's Industrial Strategy. Over 50 per cent of our research portfolio is collaborative with users providing an additional investment of £555 million (USD 914 million) from industry, government departments, public sector organizations, independent research organizations and charities.


The EPSRC Research Performance and Economic Impact Report incorporates highlights from the year including an £85 million (USD 140 million) capital equipment investment for robotics and autonomous systems, advanced materials and energy storage technologies to drive UK growth; a unique five-year collaboration with Jaguar Land Rover to develop the capability of the virtual simulation industry in the UK; and an innovative heart rate monitor, resulting from blue-skies research, demonstrated by leading semiconductor company Plessey.

**Note: The EPSRC's budget for 2014-2015 is £780 million (USD 1.3 billion). The portfolio value corresponds to the total value of awards in at given moment in time and includes multi-annual awards*.

*More information available at:*
*http://www.epsrc.ac.uk/newsevents/news/2014/Pages/impactreport2013.aspx*

## 11 UK Announces 22 New Centers for Doctoral Training

*Chancellor George Osborne with dignitaries at the Graphene Institute at the University of Manchester*

Postgraduate training in a wide range of engineering and scientific fields important to the UK's economy received a further boost today. Twenty two new Centers for Doctoral Training (CDTs) were announced by the Chancellor of the Exchequer, The Rt. Hon George Osborne. Mr Osborne made the announcement during a visit to the University of Manchester, which has been successful in securing funding for one of the new Centers. The new CDTs come on top of the 91 Centers previously announced by the Engineering and Physical Sciences Research Council (EPSRC) in November 2013 and January 2014. The Engineering and Physical Sciences Research Council (EPSRC) and other research councils have been able to fund these new Centers following a £106 million (USD 176 million) investment announced in the Budget, and by negotiating with universities, industrial partners and the Scottish Funding Council, to maximize the number of centers and the students they will be supporting.

This latest Government investment in a further 1,100 students through an additional 22 Centers for Doctoral Training (CDTs), brings the total investment in CDTs to over £500 million (USD 831 million). In addition, universities, industry and other charitable partners will be adding a further £70 million to their already large contribution of £374 million (USD 622 million) to support the training of tomorrow's scientists and engineers. The combined public and private investment amounts to over £950 million (1580 million).

*Note: Centers for Doctoral Training (CDTs) are one of the three main ways by which the EPSRC provides support for doctoral training. The other routes are the Doctoral Training Grant and Industrial Case Studentships. EPSRC-funded centres bring together diverse areas of expertise to train engineers and scientists with the skills, knowledge and confidence to tackle today's evolving issues, and future challenges. Students are funded for four years and include technical and transferrable skills training, as well as a research element. Many Centers leverage additional studentships from other sources.*

*Full Article available at: http://www.epsrc.ac.uk/newsevents/news/2014/Pages/newcdts.aspx*

## 12 Triennial Review of the UK Research Councils Published

RESEARCH COUNCILS UK

The UK Department for Business, Innovation and Skills (BIS) has published the findings of the Triennial Review of the Research Councils. The review, which examined the form, function and governance of the UK's seven Research Councils, has recognized that they are working from a position of strength. The review has also confirmed that the current number and structure of the seven Research Councils is right.

Professor Rick Rylance, Chair of Research Councils UK Executive Group, commented: *"We welcome the findings of the Triennial Review. It highlights the value that the Research Councils bring not just to the extraordinarily high quality of UK research but also its contribution to growth, prosperity and wellbeing. We are pleased that the Review recognises that our current structure supports the delivery of these."*

*More information available at: http://www.rcuk.ac.uk/media/news/140416/*

## 13 UK Minister Announces Further Investment in Doctoral Training

Postgraduate training in the UK's universities is to receive another injection of funding from The Engineering and Physical Sciences Research Council (EPSRC). This year EPSRC is investing £83.5 million (USD 140 million) through its Doctoral Training Partnerships (DTPs). The DTP includes £10 million for Doctoral Prizes (USD 17 million) and £1 million (USD 1.7 million) for Vacation Bursaries. The announcement comes shortly after the Chancellor's announcement of extra investment in 22 Centers for Doctoral Training.

The DTPs are awarded to universities for the provision of postgraduate study and are allocated each year on the basis of EPSRC research grant income. The grants allow institutions to be flexible in terms of student recruitment and retention, and enable them to vary the length of support (between three and four years) dependent on the project. This year 38 universities will benefit from the Doctoral Training Partnership funding, which ranges from £300,000 to nearly £8 million. The flexibility of the DTP allows universities to leverage funds, for example from industry, and potentially support higher numbers of students.

*More information available at: http://www.epsrc.ac.uk/newsevents/news/2014/Pages/phdtraining.aspx*

## 14 UK Lords Blame Immigration Policy for Drop in STEM Foreign Students


Numbers of international students seeking to study key subjects at universities in the United Kingdom are dropping because tighter immigration rules are creating an "unwelcoming" impression, an influential House of Lords committee says in a just-published report. The science and technology committee report calls on the UK government to rethink its immigration policy, which it says is "contradictory". And it warns that the decline is putting university courses of vital importance to the UK – the STEM subjects of science, technology, engineering and maths – under threat. International students on STEM courses fell from 58,815 in 2010-11 to 52,905 in 2012-13, a drop of more than 10%. In particular, the number of Indian students on STEM courses fell by 38% in 2011-12 and a further 28% in 2012-13. The decline is particularly acute among students on postgraduate taught courses in STEM subjects – the number of new students fell by 13% in 2010-11 and a further 3% the following year.

*Full article available at: http://www.universityworldnews.com/article.php?story=20140410182334514*